

AMENDMENTSIn the Claims

1. **(Currently Amended)** A method of processing a packet comprising:
populating a plurality of multi-feature packet processing rules in a multi-feature
classification memory; and
populating an associated content-addressable memory with a plurality of indices, wherein
said indices are indices of said plurality of multi-feature packet processing rules in
said multi-feature classification memory, **[[and]]**
said content-addressable memory and said multi-feature classification memory are
associated with one another by virtue of **said content-addressable
memory being coupled to ~~one another~~ provide an index of said indices
to said multi-feature classification memory, and**
**each of said indices corresponds to at least one of said multi-feature packet
processing rules.**
2. (Original) The method of claim 1, further comprising:
identifying a classification of said packet; and
using said classification to identify said multi-feature packet processing rule.
3. (Original) The method of claim 2, wherein said classification is based on a
plurality of parameters of said packet.
4. (Original) The method of claim 2, further comprising:
receiving said packet;
finding a match for said classification in said associated content-addressable memory;
and
receiving one of said indices from said associated content-addressable memory for one of
said multi-feature packet processing rules in said multi-feature classification
memory.

5. (Original) The method of claim 4, further comprising:
using said index to receive said multi-feature packet processing rule from said multi-feature classification memory.
6. (Original) The method of claim 4, wherein said content-addressable memory is a multi-feature content addressable memory.
7. (Original) The method of claim 4, wherein said content-addressable memory is a feature based content-addressable memory bank.
8. (Original) The method of claim 7, wherein said multi-feature packet processing rules are populated in said multi-feature classification memory according to a feature hierarchy.
9. **(Currently Amended)** A method of processing a packet comprising:
identifying a classification of said packet in a content-addressable memory;
causing said content-addressable memory to provide an index of a plurality of indices to a multi-feature classification memory, wherein said index corresponds to said classification; and
locating a multi-feature packet processing rule in a multi-feature classification memory, wherein
said locating uses said **classification index**, and
said content-addressable memory and said multi-feature classification memory are coupled to one another **by virtue of said content-addressable memory being coupled to provide said index to said multi-feature classification memory.**
10. (Original) The method of claim 9, further comprising:
processing said packet according to said multi-feature packet processing rule.
11. (Original) The method of claim 9, wherein said classification is based on a plurality of parameters of said packet.

12. (Currently Amended) The method of claim 10, further comprising:
receiving said packet;
finding a match for said classification in said content-addressable memory; and
receiving **[[an]] said** index from said content-addressable memory for said multi-feature packet processing rule in said multi-feature classification memory.
13. (Original) The method of claim 12, further comprising:
using said index to receive said multi-feature packet processing rule from said multi-feature classification memory.
14. (Original) The method of claim 12, wherein said content-addressable memory is a multi-feature content addressable memory.
15. (Original) The method of claim 12, wherein said content-addressable memory is a feature based content-addressable memory bank.
16. (Original) The method of claim 12, wherein said multi-feature packet processing rules are populated in said multi-feature classification memory according to a feature hierarchy.
17. (Currently Amended) A packet processing rule lookup system **for processing a packet,** comprising:
a multi-feature classification memory, wherein
said multi-feature classification memory is configured to store a plurality of **multi-feature** packet processing rules,
each of said multi-feature packet processing rules comprises a merged set of packet processing rules for at least one of a plurality of features, and
said each of said multi-feature packet processing rules allows said packet to be processed with regard to a set of said features corresponding to said each of said multi-feature packet processing rules; and
a content-addressable memory coupled to said multi-feature classification memory,
wherein
said content-addressable memory is configured to store a plurality of indices, and

each of said indices corresponds to at least one of said plurality of said multi-feature packet processing rules ~~for a plurality of features~~.

18. (Original) A network element comprising the packet processing rule lookup system of claim 8.

19. (Original) The network element of claim 18, further comprising:
a processor coupled to said multi-feature classification memory, said processor is configured to process a plurality of packets according to said plurality of packet processing rules.

20. (Original) The network element of claim 19, further comprising:
a network interface coupled to said processor, said network interface is configured to provide input output interface for said network element; and
a memory coupled to said processor, said memory is configured to store information.

21. (Original) The network element of claim 19, wherein said content-addressable memory is a multi-feature content addressable memory.

22. (Original) The network element of claim 19, wherein said content-addressable memory is a feature based content-addressable memory bank.

23. (Original) The network element of claim 19, wherein said multi-feature packet processing rules are populated in said multi-feature classification memory according to a feature hierarchy.

24. **(Currently Amended)** A network element comprising:
means for populating a plurality of multi-feature packet processing rules in a multi-feature classification memory; and
means for populating an associated content-addressable memory with a plurality of indices, wherein

said indices are indices of said plurality of multi-feature packet processing rules in said multi-feature classification memory, **[[and]]** said content-addressable memory and said multi-feature classification memory are associated with one another by virtue of **said content-addressable memory** being coupled to ~~one another~~ **provide an index of said indices to said multi-feature classification memory, and** **each of said indices corresponds to at least one of said multi-feature packet processing rules.**

25. (Original) The network element of claim 24, further comprising:
means for identifying a classification of said packet; and
means for using said classification to identify said multi-feature packet processing rule.

26. (Original) The network element of claim 25, wherein said classification is based on a plurality of parameters of said packet.

27. (Original) The network element of claim 25, further comprising:
means for receiving said packet;
means for finding a match for said classification in said associated content-addressable memory; and
means for receiving one of said indices from said associated content-addressable memory for one of said multi-feature packet processing rules in said multi-feature classification memory.

28. (Original) The network element of claim 27, further comprising:
means for using said index to receive said multi-feature packet processing rule from said multi-feature classification memory.

29. (Original) The network element of claim 27, wherein said content-addressable memory is a multi-feature content addressable memory.

30. (Original) The network element of claim 27, wherein said content-addressable memory is a feature based content-addressable memory bank.

31. (Original) The network element of claim 30, wherein said multi-feature packet processing rules are populated in said multi-feature classification memory according to a feature hierarchy.

32. (Previously Presented) A network element comprising:
a content-addressable memory;
means for identifying a classification of said packet in said content-addressable memory;
means for causing said content-addressable memory to provide an index of a plurality of indices to a multi-feature classification memory, wherein said index corresponds to said classification; and
means for locating a multi-feature packet processing rule in a multi-feature classification memory, wherein
said locating uses said **classification index, and**
said content-addressable memory and said multi-feature classification memory are coupled to one another **by virtue of said content-addressable memory being coupled to provide said index to said multi-feature classification memory.**

33. (Original) The network element of claim 32, further comprising:
means for processing said packet according to said multi-feature packet processing rule.

34. (Original) The network element of claim 32, wherein said classification is based on a plurality of parameters of said packet.

35. (Currently Amended) The network element of claim 33, further comprising:
means for receiving said packet;
means for finding a match for said classification in said content-addressable memory; and
means for receiving **[[an]] said** index from said content-addressable memory for said multi-feature packet processing rule in said multi-feature classification memory.

36. (Original) The network element of claim 35, further comprising:
means for using said index to receive said multi-feature packet processing rule from said multi-feature classification memory.
37. (Original) The network element of claim 35, wherein said content-addressable memory is a multi-feature content addressable memory.
38. (Original) The network element of claim 35, wherein said content-addressable memory is a feature based content-addressable memory bank.
39. (Original) The network element of claim 35, wherein said multi-feature packet processing rules are populated in said multi-feature classification memory according to a feature hierarchy.
40. (Currently Amended) A computer program product ~~for processing a packet, encoded in computer readable media, said program product comprising a set of instructions executable on a computer system, said set of instructions is configured to comprising:~~
a set of instructions executable on a computer system, wherein
said computer program product is configured to process a packet by virtue
of said program product comprising said set of instructions, and
said set of instructions is configured to
populate a plurality of multi-feature packet processing rules in a multi-
feature classification memory[[;]] , and
populate an associated content-addressable memory with a plurality of
indices, wherein
said indices are indices of said plurality of multi-feature packet
processing rules in said multi-feature classification
memory, [[and]]
said content-addressable memory and said multi-feature
classification memory are associated with one another by
virtue of said content-addressable memory being coupled

to ~~one another~~ provide an index of said indices to said multi-feature classification memory, and each of said indices corresponds to at least one of said multi-feature packet processing rules; and computer readable storage media, wherein said computer program product is encoded in said computer readable storage media.

41. (Original) The computer program product of claim 40, wherein said set of instructions is further configured to:

identify a classification of said packet; and
use said classification to identify said multi-feature packet processing rule.

42. (Original) The computer program product of claim 41, wherein said classification is based on a plurality of parameters of said packet.

43. (Original) The computer program product of claim 41, wherein said set of instructions is further configured to:

receive said packet;
find a match for said classification in said associated content-addressable memory; and
receive one of said indices from said associated content-addressable memory for one of said multi-feature packet processing rules in said multi-feature classification memory.

44. (Original) The computer program product of claim 43, wherein said set of instructions is further configured to:

use said index to receive said multi-feature packet processing rule from said multi-feature classification memory.

45. (Original) The computer program product of claim 43, wherein said content-addressable memory is a multi-feature content addressable memory.

46. (Original) The computer program product of claim 43, wherein said content-addressable memory is a feature based content-addressable memory bank.

47. (Original) The computer program product of claim 46, wherein said multi-feature packet processing rules are populated in said multi-feature classification memory according to a feature hierarchy.

48. (Currently Amended) A computer program product ~~for processing a packet, encoded in computer readable media, said program product comprising a set of instructions executable on a computer system comprising a content-addressable memory, said set of instructions is configured to~~ comprising:

a set of instructions executable on a computer system, wherein

said computer system comprises a content addressable memory,

said computer program product is configured to process a packet by virtue

of said program product comprising said set of instructions, and

said set of instructions is configured to

identify a classification of said packet in said content-addressable memory[[]] ,

causing said content-addressable memory to provide an index of a

plurality of indices to a multi-feature classification memory,

wherein said index corresponds to said classification, and

locate a multi-feature packet processing rule in a multi-feature classification memory, wherein

said locating uses said ~~classification~~ index, and

said content-addressable memory and said multi-feature

classification memory are coupled to one another by virtue

of said content-addressable memory being coupled to

provide said index to said multi-feature classification

memory; and

computer readable storage media, wherein said computer program product is

encoded in said computer readable storage media.

49. (Original) The computer program product of claim 48, wherein said set of instructions is further configured to:
processing said packet according to said multi-feature packet processing rule.

50. (Original) The computer program product of claim 48, wherein said classification is based on a plurality of parameters of said packet.

51. (Previously Presented) The computer program product of claim 49, wherein said set of instructions is further configured to:
receive said packet;
find a match for said classification in said content-addressable memory; and
receive an index from said content-addressable memory for said multi-feature packet processing rule in said multi-feature classification memory.

52. (Original) The computer program product of claim 51, wherein said set of instructions is further configured to:
use said index to receive said multi-feature packet processing rule from said multi-feature classification memory.

53. (Original) The computer program product of claim 51, wherein said content-addressable memory is a multi-feature content addressable memory.

54. (Original) The computer program product of claim 51, wherein said content-addressable memory is a feature based content-addressable memory bank.

55. (Original) The computer program product of claim 51, wherein said multi-feature packet processing rules are populated in said multi-feature classification memory according to a feature hierarchy.

56. (Previously Presented) The method of claim 1, further comprising:

retrieving a one of said plurality of indices stored in an entry of said associated content-addressable memory by accessing said entry of said associated content-addressable memory, wherein
said one of said plurality of indices is stored in said entry of said associated content-addressable memory; and
accessing a one of said plurality of multi-feature packet processing rules in said multi-feature classification memory using said one of said plurality of indices, wherein
said one of said plurality of indices corresponds to said one of said plurality of multi-feature packet processing rules.

57. (Previously Presented) The method of claim 9, wherein
said identifying generates an index, and
said locating uses said index to locate said multi-feature packet processing rule.

58. (Previously Presented) The network element of claim 17, wherein
said content-addressable memory is configured to provide a one of said plurality of indices to said multi-feature classification memory, in response to an entry of said associated content-addressable memory being accessed, wherein
said one of said plurality of indices is stored in said entry of said associated content-addressable memory, and
said multi-feature classification memory is configured to produce a one of said plurality of packet processing rules for said plurality of features, in response to receiving said one of said plurality of indices, wherein
said one of said plurality of packet processing rules for said plurality of features corresponds to said one of said plurality of indices.